

CLAIMS

What is claimed is:

1. A spindle unit for a machine tool, comprising:
a drive unit having a drive shaft,
a spindle head assembly constructed to receive a tool and having a hollow spindle head shaft which is driven by the drive unit;
a gear mechanism arranged between the drive unit and the spindle head assembly; and
a shifting unit for axially moving the drive shaft in such a way that in a first position the drive shaft is connected by interference fit with the spindle head assembly through intervention of the gear mechanism, and in a second position is directly connected by interference fit with the spindle head assembly.
2. The spindle unit of claim 1, wherein the gear mechanism is constructed to include a planetary gear mechanism.
3. The spindle unit of claim 1, wherein the drive unit includes an electric motor having a rotor mounted on the drive shaft.
4. The spindle unit of claim 3, wherein the rotor is shrink-fitted on the drive shaft.

5. The spindle unit of claim 3, wherein the electric motor includes a stator which completely surrounds the rotor in the first and second positions of the drive shaft.
6. The spindle unit of claim 1, wherein the spindle head assembly is constructed for removal from the drive unit.
7. The spindle unit of claim 1, and further comprising an axially displaceable bearing assembly for support of the drive shaft.
8. The spindle unit of claim 6, wherein the drive shaft has opposite ends, said bearing assembly having a bearing sleeve for support of one end of the drive shaft, and another bearing sleeve for support of the other end of the drive shaft.
9. The spindle unit of claim 1, wherein the shifting unit is constructed for operation by one of hydraulic means, pneumatic means, and electromechanical means.

10. A method for operating a spindle unit for a machine tool, comprising the steps of:
- operating a drive shaft in a first position for driving a spindle head shaft through intervention of a gear mechanism;
- axially shifting the drive shaft to a second position in which the spindle head shaft is connected directly by interference fit, without intervention of the gear mechanism; and
- driving the spindle head shaft directly by the drive shaft in the second position.
11. The method of claim 10, wherein the drive shaft is part of an electric motor having a rotor which is moved in axial direction when the drive shaft is moved between the first and second positions.
12. The method of claim 10, wherein the axially shifting step is realized by one of hydraulic means, pneumatic means, and electromechanical means.